# Cities—National and Global Security Issues

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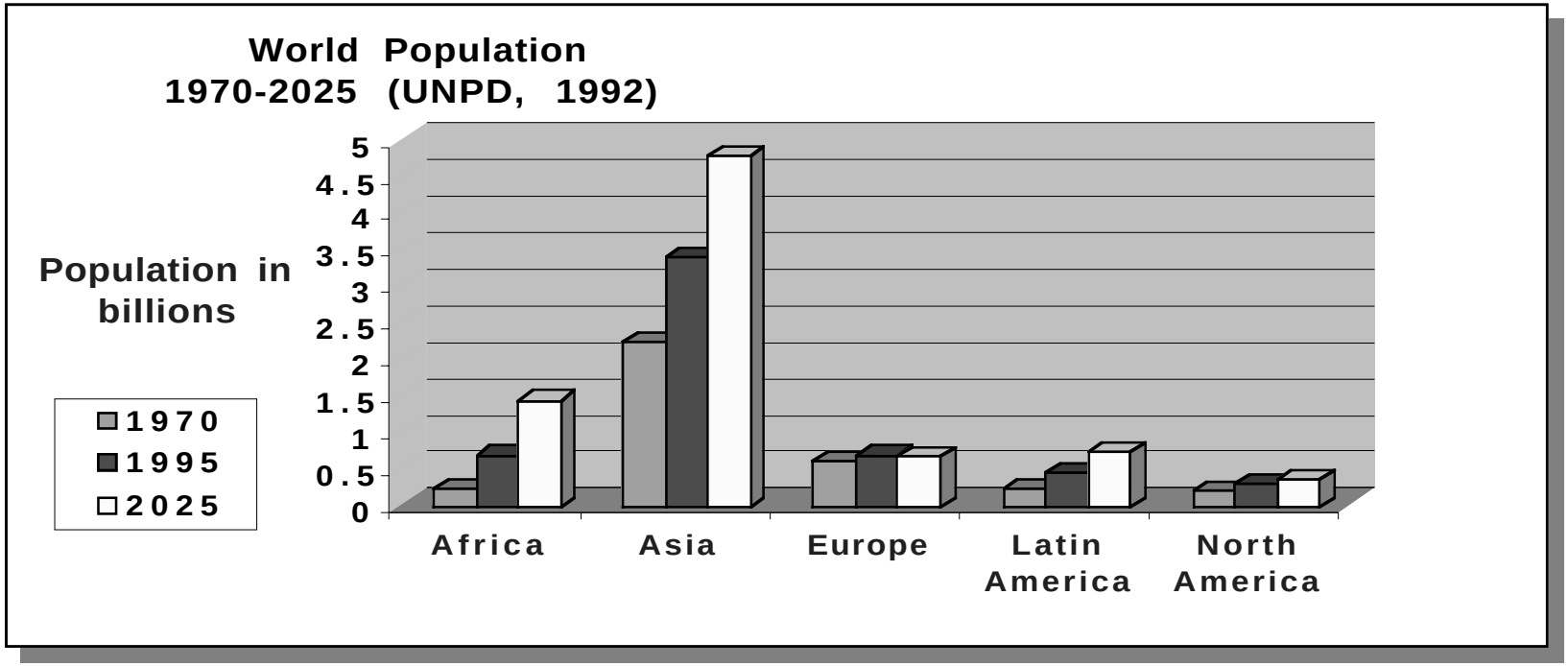
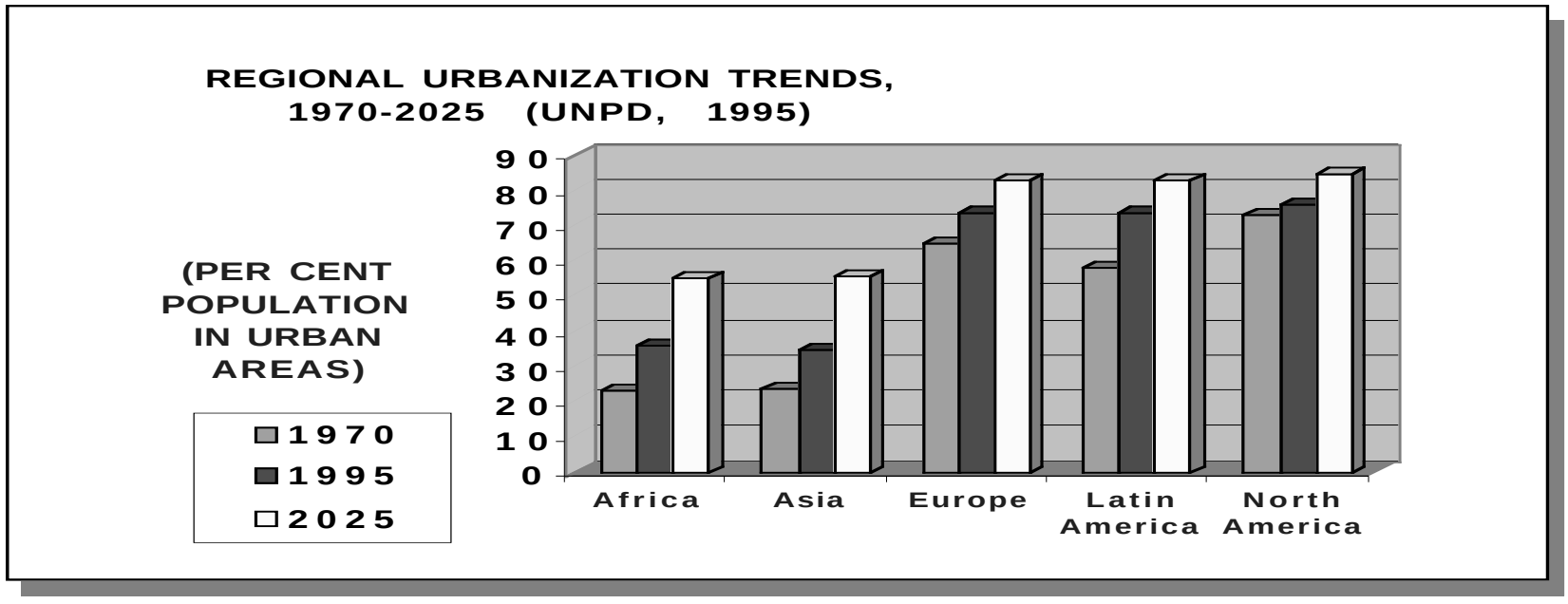
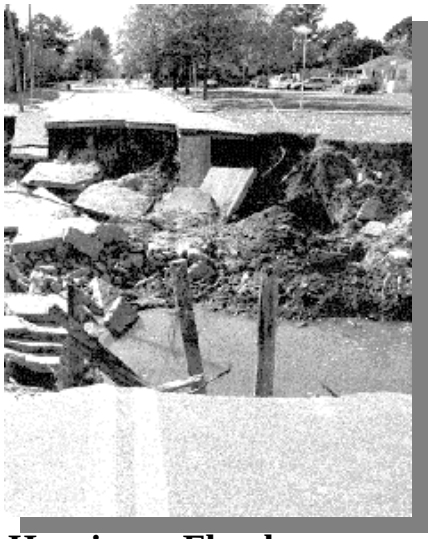

World Population
1970-2025 (UNPD, 1992)
Population in billions
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1970
1995
2025
Africa
Asia
Europe
Latin America
North America


REGIONAL URBANIZATION TRENDS,
1970-2025 (UNPD, 1995)
(PER CENT POPULATION IN URBAN AREAS)
90
80
70
60
50
40
30
20
10
0
1970
1995
2025
Africa
Asia
Europe
Latin America
North America

**Earthquake, Nimitz Freeway, Oakland, California,1989**

**Plague, London, 1665**

**Grozny, 2000**

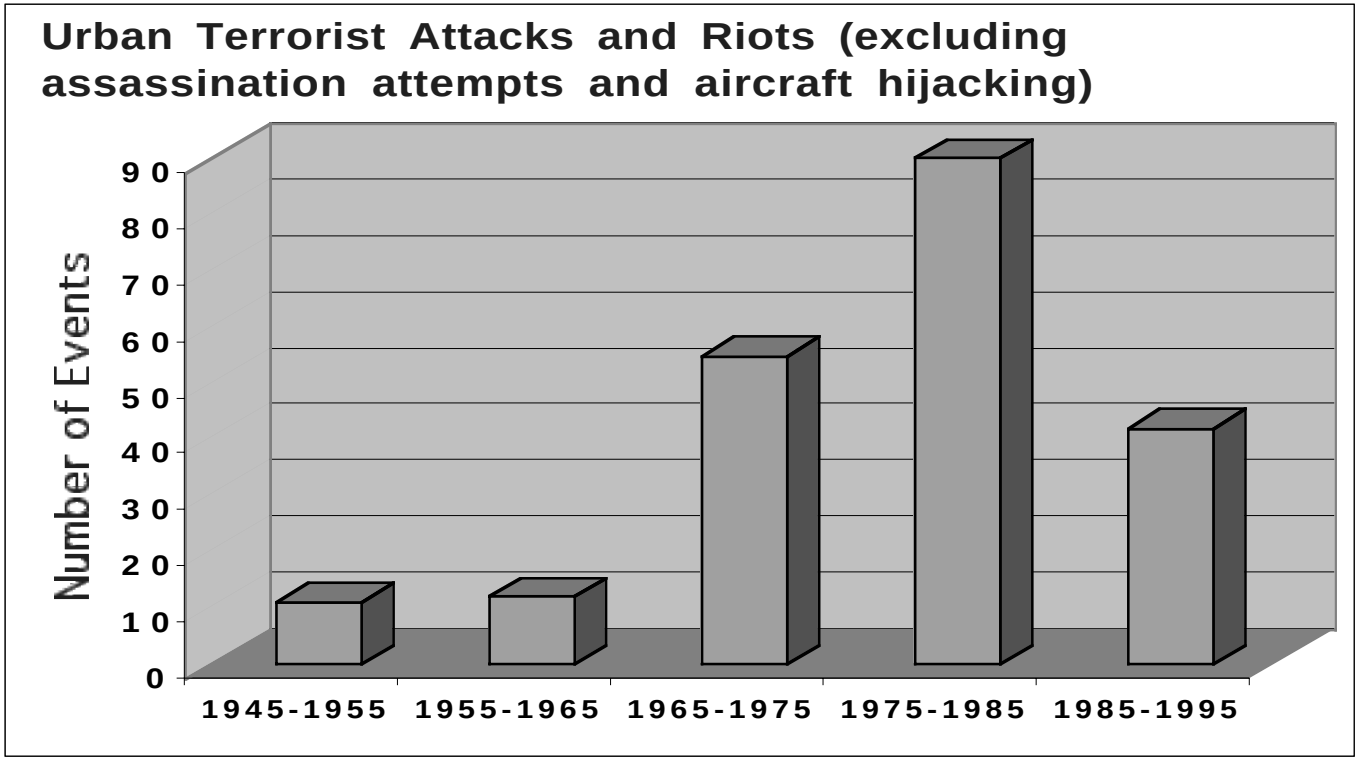


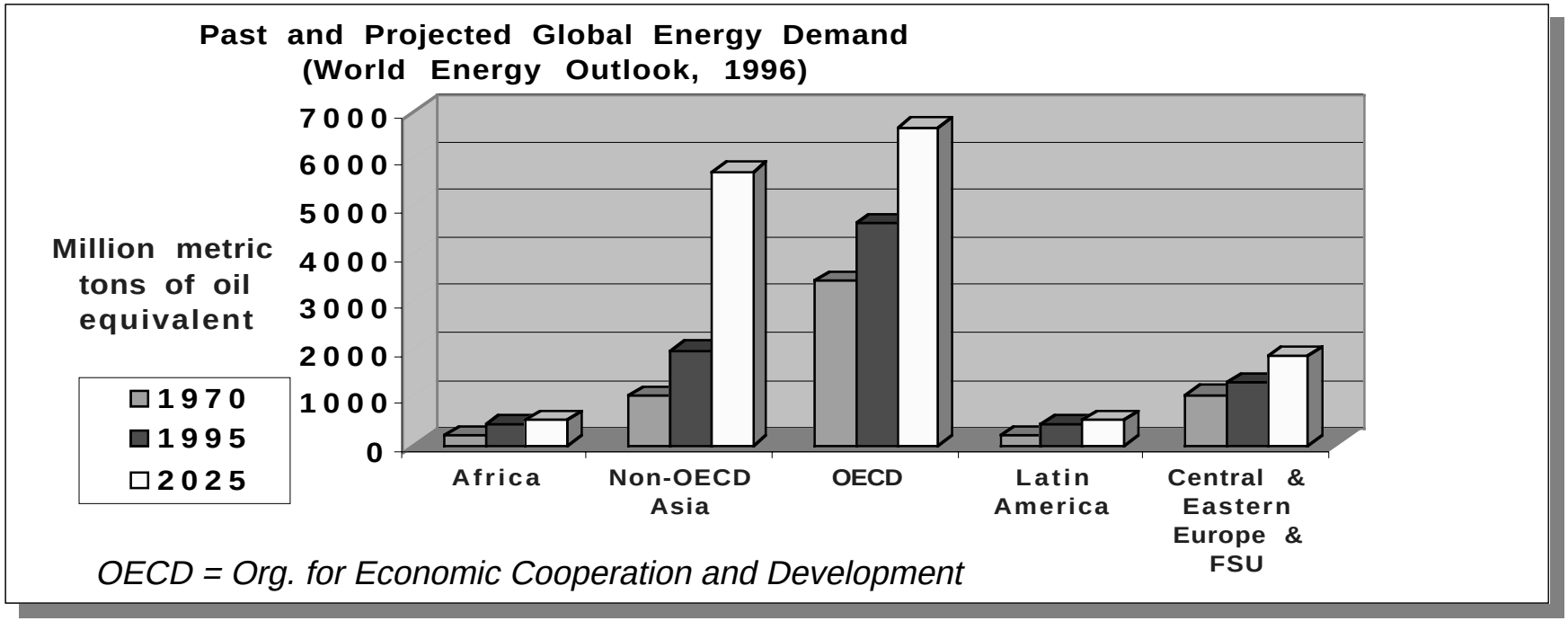
**Hurricane Floyd**

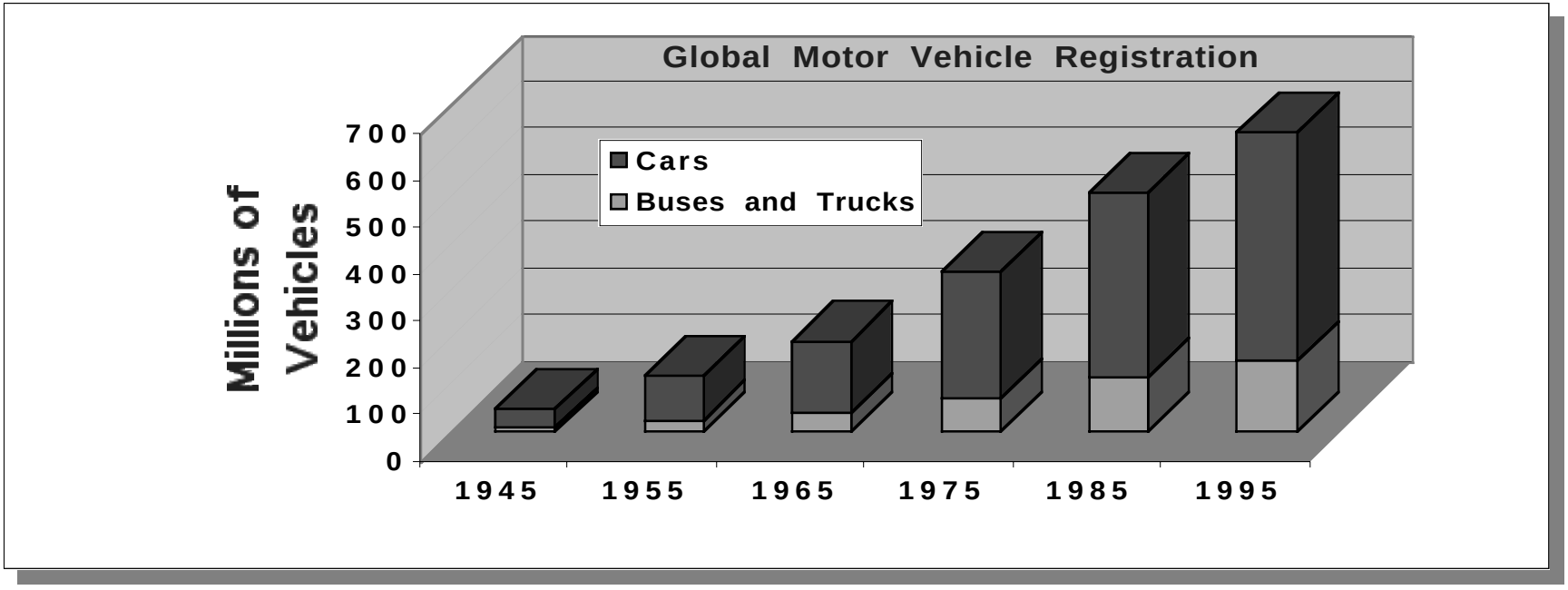
**Oklahoma City**

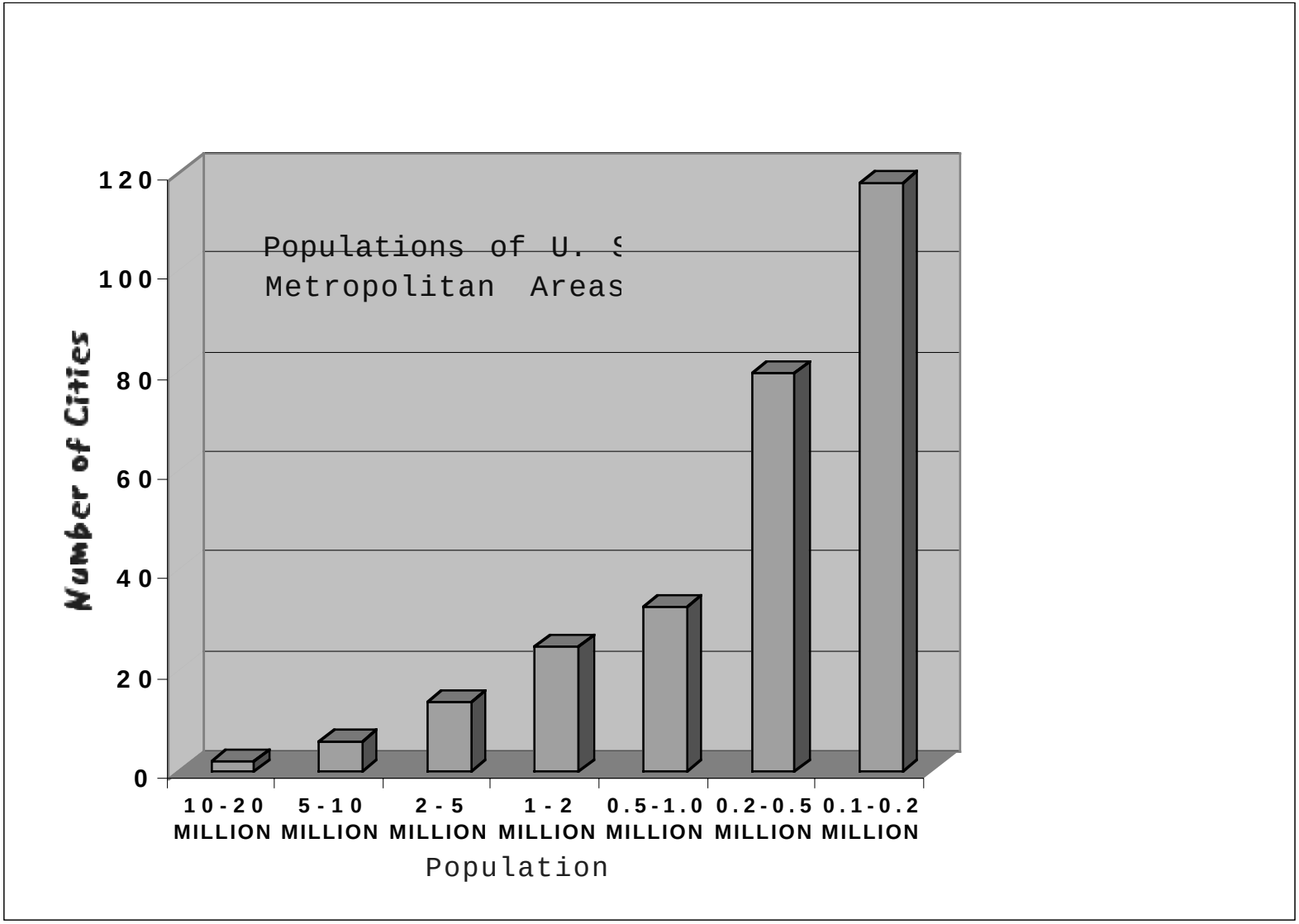
**CITIES WITH MAJOR INCIDENTS OF SOCIAL VIOLENCE SINCE 1989 (MITCHELL, 1999)**

| Civil/Internal War or Urban Terrorism | | Riots or Street Protests by the Civilian Population | External Warfare |
|---|---|---|---|
| Baku | Madrid | Beograd | Baghdad |
| Beijing | Manchester | Bombay | Beograd |
| Bogota | Mogadishu | Calcutta | Groznyi |
| Buenos Aires | Monrovia | Dhaka | |
| Cairo | Moscow | Jakarta | |
| Colombo | New York | Los Angeles | |
| Kabul | Oklahoma City | Rangoon (Yangon) | |
| Karachi | Paris | | |
| Kinshasha | Phnom Penh | | |
| Lahore | Port au Prince | | |
| Lima | Tblisi | | |
| London | Tokyo | | |


Urban Terrorist Attacks and Riots (excluding assassination attempts and aircraft hijacking)
Number of Events
0
10
20
30
40
50
60
70
80
90
1945-1955
1955-1965
1965-1975
1975-1985
1985-1995


Past and Projected Global Energy Demand
(World Energy Outlook, 1996)
Million metric tons of oil equivalent
7000
6000
5000
4000
3000
2000
1000
0
1970
1995
2025
Africa
Non-OECD Asia
OECD
Latin America
Central & Eastern Europe & FSU
OECD = Org. for Economic Cooperation and Development


Global Motor Vehicle Registration
Millions of Vehicles
700
600
500
400
300
200
100
0
Cars
Buses and Trucks
1945
1955
1965
1975
1985
1995


Populations of U. S
Metropolitan Areas
Number of Cities
120
100
80
60
40
20
0
10-20 MILLION
5-10 MILLION
2-5 MILLION
1-2 MILLION
0.5-1.0 MILLION
0.2-0.5 MILLION
0.1-0.2 MILLION
Population

# Domestic Urban Research Needs

- Understanding the interdependencies of urban systems
- Integration of the physical and social sciences (human systems and natural systems)
- Mitigation of natural disasters (hazard mapping, natural process modeling, crisis forecasting and planning)
- New tools for long-range urban planning
- Identifying vulnerability to terrorism or large-scale mischief

• Cities are infrastructure hubs (Critical Infrastructure Protection, TRANSIMS, ELISIMs)

# Problems facing development of “Urban Science”

- Privacy; judicious use of census data and surveys without the vision of “big brother”
- Communication and collaboration between federal, state, and municipal agencies with regard to integrated science and funding. The need to stop “working in a box.”
- Changing the *Status Quo*
  - The sciences; more applied, integrated science should be rewarded. Getting scientists to work in the cities.
  - The Cities; recognizing the value of applied interdisciplinary urban science.

“Los Alamos will be the premier laboratory in the world applying science to the solution of technical problems critical to national and global security”

—Institutional Plan, 1999-2004

*Security*—”1. Freedom from risk or danger; safety. 2. Freedom from doubt, anxiety, or fear; confidence”

– American Heritage Dictionary, 1978

# Urban Science;
## recent lab activities

- *Urban Security*; development work + projects in Dallas and Los Angeles
- *Critical Infrastructure Protection*; national, but with city hubs
- *TRANSIMS*; development work + projects in Dallas and Portland
- Research on epidemics
- *Integrated Environmental Modeling*; Albuquerque + potential work in arid cities
- *Chem/Bio* threat reduction; development work + projects in Los Angeles and Salt Lake City
- Atmospheric research; Mexico City and El Paso / Juarez
- Collaboration with Phoenix Long-Term Ecological Research Project

# The Future?

- Most of humanity will be living in cities in close quarters
- Future threats to global stability caused by environmental and resources failures that in turn lead to failed governments, mass migration, and conflict
- The *status quo* is traditional planning and management by a myriad of bureaucracies, which cannot handle the complexities of large cities
- We must view cities as national resources and as “systems of systems”

# The Future at Los Alamos?

- “Homeland defense,” the effects of natural hazards, uncontrolled growth, unstable bureaucracies, environmental security, and cost-effective urban planning are all urban problems that can be addressed by research at the national labs
- Integrated science approaches to understanding how cities function
- R & D for new approaches to city planning, management and decision making

# The Future at Los Alamos?

- Tools to monitor change, relying heavily on remote sensing and pattern recognition programs as well as the tools for quantifying change
- Virtual training environments (e.g., city managers, emergency responders, and utilities engineers)
- The human dimension; more research that integrates the social, behavioral, and economic sciences into our projects

# Where do we go from here?

- We must identify “champions” in DoE, any other appropriate agencies and in Congress, who will support new initiatives needed for integrated urban research
- Promote a high-level interagency workshop sponsored by the National Academy of Sciences and/or OSTP, which involves the labs and representatives of the cities
- Yet more integration between LANL divisions for urban research